

REMARKS/ARGUMENTS

In the Office Action dated February 24, 2006, Claims 1-17 were pending. Claims 1-17 were objected to and were rejected under 35 U.S.C. 103(a). The drawings were objected to.

Also, the Examiner noted that the Information Disclosure Statement submitted on 3/22/05 is being considered.

The drawings were objected to because A1*, A2*, A1, and A2 are not shown in the drawings. These symbols represent detected or calculated values. Therefore, they are not specifically located or represented by components in the figures. The symbols are explained in the description of the invention and would not have a single location in the figures. Additionally, the symbols A1*, A2*, A1, and A2 have been deleted from the claims. It is submitted that it is not necessary to use these symbols in the claims and the meaning of the claims is clear without them. Since these symbols have been removed from the claims and they are detected or calculated values without a specific location, it is respectfully submitted that corrected drawings are no longer necessary and the objection to the Drawings should be withdrawn. Withdrawal of the objection to the Drawings is requested.

Claims 1-17 are objected to because of a number of informalities. The claims have been extensively amended to correct these informalities. It is respectfully submitted that this objection is no longer applicable and this objection should be withdrawn. Withdrawal of this objection is requested.

Claims 1-17 were rejected under 35 U.S.C. 103(a) as being unpatentable over Karwath et al (6,825,625) in view of Skelton (5,710,495).

With respect to claim 1, the patent to Karwath et al discloses a device with an electric motor comprising an electric drive 10, a power semiconductor component, an evaluation circuit

28, and a microcontroller 12 for controlling the PWM duty cycles of the electric drive. Karwath et al shows the evaluation circuit 28 connected to the microcontroller 12 for providing the “to-be-expected” or normal operation number of pulses. The evaluation circuit 28 compares the number of detected pulses with the normal operation number of pulses.

The Examiner notes that claim 1 as submitted by the applicants, recites that the electric drive can be operated in a partial load range and in a full load range. Therefore, the Examiner applies Skelton to disclose an apparatus and method for measuring average motor current comprising an evaluation circuit 28 connected to a pulse-current sensing resistor 20 and devices 24 and 26 for controlling the PWM in a partial load range and a full load range. The Examiner contends a prima facie case is made that Karwath et al and Skelton disclose motor PWM control systems used for the same environment to control the PWM of the motor. The Examiner also contends one of ordinary skill in the art looking for a PWM duty cycle control system would appreciate the PWM control as taught or suggested by Skelton to control the PWM signal in different duty cycles for different load ranges for different speed controls of a motor.

Claim 1 defines a method to detect sluggishness or blocking of an electric drive, which is triggered via a power semiconductor component (7) and is operated in a partial load range and in a full load range as a function of the timing of a PWM signal (29, 31). An evaluation circuit (38) is connected with the microcontroller (25). According to the present invention, pulses are generated within a time interval that is detected in the evaluation circuit (38) from the current I flowing over the first power semiconductor component (7). The number of detected pulses are compared with the normal operation number of pulses.

Claim 1 has been amended to add “wherein the triggering of the electrical drive (3), having a free-wheeling circuit (6) containing a second power semiconductor component (32,

takes place via the PWM signal (29, 31), which is output to a first PWM triggering branch (32) and a second PWM triggering branch (34) for alternating triggering of the power of the semiconductor components (7,32).”

After reviewing Karwath and Skelton, it is contended that these references do not disclose the triggering of the electrical drive (3), having a free-wheeling circuit (6) containing a second power semiconductor component (32), takes place via the PWM signal (29, 31), which is output to a first PWM triggering branch (32) and a second PWM triggering branch (34) for alternating triggering of the power semiconductor components (7, 32). In the Skelton reference, a circuitry (28) receives a difference between the first and second currents and generates an output voltage indicative of the average motor current. In the Skelton reference, a first current source (26) generates a first current generally proportional to the motor winding current. A second current substantially proportional to a chopped output voltage is also produced and subtracted from the first current. According to the Karwath et al reference, a nonvolatile storage element (14) is used for storing at least one variable as a definition for a motor function. The at least one variable is transferred via a dataline (13). Still further, an internal data bus (15) is used between the storage element (14) and the microcontroller (12). Neither reference discloses a free-wheeling circuit. A free-wheeling circuit (6) according to dependent claim 12 of the current application, particularly containing a second power semiconductor component (32), is not disclosed in the Karwath reference or the Skelton reference or a combination of Karwath and Skelton.

As currently amended, all claims depend either directly or indirectly on claim 1. Therefore, all claims include a free-wheeling circuit containing a second power semiconductor component. It is therefore respectfully contended that all claims are now unobvious and

patentably distinct over Karwath and Skelton. It is requested that the objection of obviousness based on Karwath combined with Skelton be withdrawn.

CONCLUSION

In light of the foregoing, applicants respectfully submit that the claims as amended have corrected the informalities, are no longer obvious in view of Karwath and Skelton, and therefore are allowable. It is respectfully requested that such allowance be granted.

The undersigned is available for telephone consultation during normal business hours.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Donald W. Walk', with a stylized, cursive script.

Donald W. Walk
Reg. No. 29,118

Docket No.: 081276-1058-00
Michael Best & Friedrich LLP
100 East Wisconsin Avenue
Suite 3300
Milwaukee, Wisconsin 53202-4108
414.271.6560